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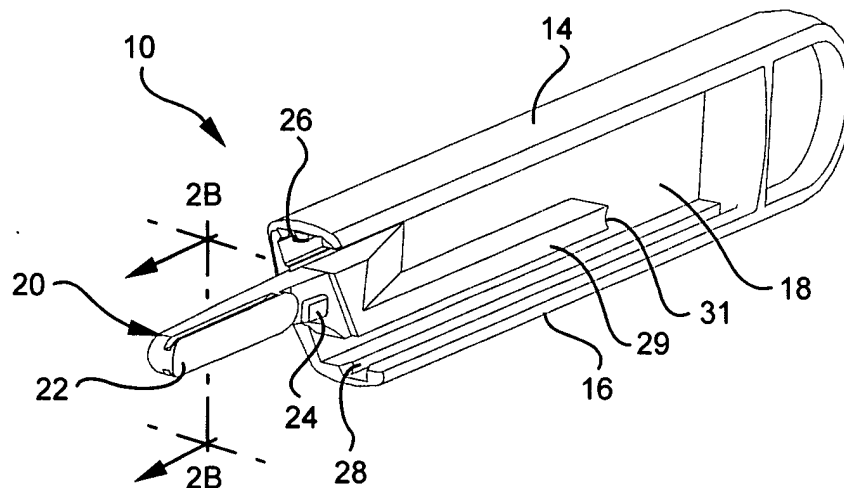
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(54) **Surgical scalpel assembly**

(57) A surgical scalpel assembly includes a handle having at least one attachment element and at least one guide element. The assembly also has a guard including at least one guide member configured to engage the at least one guide element of the handle such that the guard is movably connectable with the handle. The guard includes a first biased arm having a first boss and

a second cantilevered arm having a second boss. The assembly also includes a blade having an attachment groove configured to engage the attachment element of the handle. The blade includes a first hole configured to receive the first boss when the blade is connected to the guard and a second hole configured to receive the second boss when the blade is connected to the guard.

FIG. 1



Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] This invention relates generally to surgical scalpels and, more particularly, to surgical scalpels having shields or guards to cover the scalpel blade when not in use.

2. Technical Considerations

[0002] As will be appreciated by one skilled in the medical arts, sharp surgical instruments, such as scalpels, provide a significant potential for harm to surgeons, nurses, and other support personnel. The rapid handling of these sharp instruments can lead to accidental cuts or puncture wounds during surgery. In order to address this problem, blade shields have been developed to cover the scalpel blade when the scalpel is not in use. The shields can be retracted to expose the blade when needed.

[0003] While early blade shields did help reduce the potential for accidental cuts or puncture wounds, there were some problem areas. For example, some of the blade shields were awkward to operate, often requiring two hands to operate. Others included complex mechanical mechanisms to move the shield, which mechanisms could be prone to mechanical failure.

[0004] Improved scalpel blade protection devices were subsequently developed to address these issues. These scalpel systems provide improved handling and safety features compared to the earlier devices. For example, U.S. Patent No. 6,053,929 discloses a surgical scalpel system having a handle and a cartridge removably mounted on the handle. The cartridge includes a blade holder and a shield. Another surgical scalpel is disclosed in PCT WO 01/05312. This scalpel has a handle that can be attached to a guard containing the scalpel blade. Examples of other known scalpels having blade shields or covers are disclosed in U.S. Patent Nos. 5,250,064; 5,342,379; 5,527,329; 5,938,675; 5,938,676; and 5,919,201. While these systems provide some advantages over the earlier blade protection devices, improvements could still be made to these devices.

[0005] Therefore, it is an object of the invention to provide a surgical scalpel assembly that reduces the complexity of prior known scalpel devices and which also provides additional safety and manufacturing benefits over known scalpel systems.

SUMMARY OF THE INVENTION

[0006] A surgical scalpel assembly of the invention comprises a handle having at least one attachment element and at least one guide element. The assembly

further includes a guard comprising at least one guide member configured to engage the at least one guide element of the handle such that the guard is movable on the handle between a first position and a second position. The guard can include a first biased arm having a first boss, and a second movable, e.g., cantilevered, arm having a second boss. The assembly additionally comprises a blade having an attachment groove configured to engage the attachment element of the handle. The blade can include a first hole configured to receive the first boss when the blade is connected to the guard and the handle is not attached to the blade, and a second hole configured to receive the second boss when the blade is connected to the guard and the guard is in the first position.

[0007] Another surgical scalpel assembly of the invention comprises a handle comprising a blade carrier having a blade attachment element. A guard of the assembly comprises a retaining arm having a non-arcuate retaining boss. A blade of the assembly comprises a slot configured to engage the attachment element of the blade carrier, and a retaining hole having a non-arcuate shape and configured to engage the retaining boss of the guard.

[0008] A further surgical scalpel assembly of the invention comprises a handle having a handle body with a blade attachment element projecting therefrom. The handle can have a side wall, a top wall, and a bottom wall defining a handle cavity. Guide grooves are defined in the top wall and bottom wall. A guard of the assembly comprises a guard body having a top wall, a bottom wall, and a side wall defining a guard cavity. A guide rail projects from the top wall and bottom wall of the guard and the guide rails are configured to engage the guide grooves in the handle body such that the guard is slidable into and out of the handle body. The guard further includes a first or retaining arm biased inwardly from the guard side wall, with a first retaining boss attached to the retaining arm. The retaining boss has a non-arcuate cross section. A second or locking arm can be biased inwardly from the guide sidewall. The locking arm can be a movable, e.g., cantilevered, arm with a locking boss attached at one end. A blade deflection device can be movably mounted on the guard. A blade of the assembly comprises an elongated attachment slot configured to engage the blade attachment element of the handle, a first hole configured to engage the first boss of the first (retaining) arm, and a second hole configured to receive the second boss of the second (locking) arm.

[0009] A still further surgical scalpel assembly of the invention comprises a blade having a pair of rear arms, each arm having an engagement member and an attachment member. A guard has a pair of engagement elements configured to engage the engagement members of the blade arms to bias the arms outwardly. A handle has a pair of attachment elements configured to engage the attachment members of the blade when the handle is inserted between the blade arms.

[0010] Another surgical scalpel assembly comprises a handle and a blade and guard assembly. The blade and guard assembly comprises a guard comprising a first biased arm having a first boss, a second movable, e.g., cantilevered, arm having a second boss, and a blade having an attachment member configured to engage the handle. The blade further includes a first hole configured to receive the first boss when the blade is connected to the guard and the handle is not attached to the blade, and a second hole configured to receive the second boss when the blade is in the guard.

[0011] An additional surgical scalpel assembly comprises a handle having a blade attachment element, a blade having an attachment member configured to engage the attachment element of the handle, and a guard configured to engage the handle. The guard includes a blade deflection device.

[0012] A further surgical scalpel assembly comprises a handle having a blade attachment element and a locking device, a blade having a locking element and an attachment element, and a guard having a locking arm configured to engage the locking element of the blade when the guard is in a first position and configured to engage the locking device of the handle when the guard is in a second position.

[0013] A blade and guard assembly of the invention comprises a guard with a first biased arm having a first boss, a second movable, e.g., cantilevered, arm having a second boss, and a blade. The blade includes an attachment member configured to engage the handle, a first hole configured to receive the first boss when the blade is connected to the guard and the handle is not attached to the blade, and a second hole configured to receive the second boss when the blade is in the guard.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] Additional advantages and details of the invention are explained in greater detail below with reference to the exemplary embodiments illustrated in the accompanying schematic drawings, in which:

[0015] FIG. 1 is a perspective view of a scalpel handle incorporating features of the invention;

[0016] FIG. 2A is a front view of the handle of FIG. 1;

[0017] FIG. 2B is a sectional view taken along the line IIB-IIB of FIG. 1;

[0018] FIG. 3 is a perspective view of a blade incorporating features of the invention;

[0019] FIG. 4 is a side view (closed side) of a guard incorporating features of the invention;

[0020] FIG. 5 is a side view (open side) of the guard of FIG. 4;

[0021] FIG. 6 is a top view of the guard of FIG. 5;

[0022] FIG. 7 is a side view of the guard of FIG. 5 with the blade positioned in the guard;

[0023] FIG. 8 is a front view of the blade and guard assembly of FIG. 7;

[0024] FIG. 9 is a perspective view of the handle at-

tached to the blade and guard assembly of FIG. 7 with the guard partially retracted into the handle;

[0025] FIG. 10 is a front view of the surgical scalpel assembly of FIG. 9;

[0026] FIG. 11 is a plan view of an alternative guard incorporating features of the invention; and

[0027] FIG. 12 is a side view of another blade and guard assembly incorporating features of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0028] As used herein, spatial or directional terms, such as "front", "rear", "left", "right", and the like, relate to the invention as it is shown in the drawing figures. However, it is to be understood that the invention can assume various alternative orientations and, accordingly, such terms are not to be considered as limiting. Additionally, all references referred to in this document are to be understood as being incorporated by reference in their entirety.

[0029] The individual components of an exemplary surgical scalpel assembly incorporating features of the invention will first be described and then operation of the exemplary scalpel assembly will be discussed. However, it is to be understood that the exemplary scalpel assembly described herein is simply to illustrate the general features of the invention and that the invention is not limited to the specifically disclosed exemplary embodiments.

[0030] A scalpel handle **10** of the invention is shown in Figs. 1, 2A, and 2B. The handle **10** can be made of any desired material, such as but not limited to plastics, metal, etc., and can be of any desired dimensions. In the illustrated embodiment, the handle **10** has a substantially "C" shaped profile in cross section (i.e., has a substantially closed side and a substantially open side). The handle **10** has a first side wall **12**, a top wall **14**, and a bottom wall **16** that define an interior hollow space or cavity **18** within the handle **10**. The handle **10** can be made of a single piece of material, such as metal, with the side wall **12**, top wall **14**, and bottom wall **16** being of a unitary structure. The handle **10** can have a second side wall opposite the first side wall **12** or, as shown in the exemplary embodiment, the second side of the handle **10** (opposite the first side wall **12**) can be open.

[0031] The handle **10** further includes a blade carrier **20** configured to engage a surgical blade as described in more detail below. In the exemplary embodiment, the blade carrier **20** is formed as a conventional projection or "finger" extending from the front of the handle **10**. The finger includes an attachment element **22** configured to engage a portion of the blade to hold the blade onto the handle **10** in conventional manner. In the illustrated embodiment, the attachment element **22** is configured as a raised portion extending from the side of the finger. However, in the broad practice of the invention, any conventional attachment means could be used. The handle

10 further includes an unlocking element **24**. In the illustrated embodiment, the unlocking element **24** is formed by a projection extending outwardly from the side of the finger to the rear of the attachment element **22**.

[0032] As shown particularly in FIG. 2A, the handle **10** also includes at least one guide member to receive a blade guard as described in more detail below. The guide member(s) can be of any conventional design. However, in the illustrated exemplary embodiment, the guide members are configured as opposed grooves **26**, **28** formed in the top wall **14** and bottom wall **16**, respectively, of the handle **10** and extend at least partly along the length of the interior of the top wall **14** and bottom wall **16**.

[0033] The handle **10** can also include a guard locking device to allow the guard to be locked in a retracted position, i.e., such that at least a portion of the blade is exposed. In the illustrated exemplary embodiment, the locking device is configured as a rib **29** extending along the handle cavity **18**. The rib **29** includes an end surface **31** configured to engage a locking element, e.g., a locking boss, on the guard as described in more detail below. However, in the broad practice of the invention, any conventional device to retain the guard in a retracted position could be used.

[0034] A blade **30** incorporating features of the invention is shown in FIG. 3. The blade **30** can be of any conventional length or dimensions as are well known in the surgical art. The blade **30** has a front **32** and a rear **34** and includes an attachment member **36** configured to engage the attachment element **22** of the blade carrier **20** to attach the blade **30** to the handle **10**. In the illustrated embodiment, the attachment member **36** is configured as a conventional slot having a wider portion and a narrower portion configured to releasably engage the attachment element **22** on the handle **10**. Such a conventional blade slot is well known in the art and will not be described in detail.

[0035] However, in one non-limiting practice of the invention, the blade **30** can further include a retaining element, such as a first or retaining hole **38** positioned near the rear **34** of the blade **30**. While in the broad practice of the invention the retaining hole **38** can be of any shape, as will be described below it is particularly advantageous if the retaining hole **38** is of a non-arcuate shape. By "non-arcuate" is meant that the retaining hole **38** does not have a round or curved shape, such as a circular shape, but rather has one or more straight sides, such as a quadrilateral shape, for example a square or rectangular shape. In another non-limiting embodiment, the blade **30** may not have a separate retaining hole **38** but, rather, the attachment member **36** can be configured to receive a retaining device, as described in more detail below.

[0036] The blade **30** can further include a locking element, such as a second or locking hole **40** which can be positioned forward of the retaining hole **38**. The locking hole **40** can be of any desired shape but in the illus-

trated embodiment the locking hole **40** has an arcuate shape, i.e., a round shape.

[0037] A guard **44** incorporating features of the invention is shown in Figs. 4-8. In the illustrated embodiment, the guard **44** can be substantially "C" shaped in cross section and can have a side wall **46**, a top wall **48**, and a bottom wall **50** (FIG. 8). The guard **44** can be made of any desired material, such as metal, plastic, or a combination of metal and plastic. However, it is to be understood that the guard **44** is not limited to this configuration but could have a closed structure, i.e., a second side wall opposite the first side wall **46**. The guard **44** includes at least one guide element configured to engage the at least one guide member in the handle **10** as described in more detail below. In the illustrated embodiment, the guide element(s) are configured as ribs or rails **52**, **54** extending outwardly from the top wall **48** and bottom wall **50**, respectively, of the guard **44**. However, it is to be understood that this is simply one exemplary configuration for the guide elements and that the invention is not limited to these specific guide elements.

[0038] The guard **44** can further comprise a first or retaining arm **58** which can be formed integrally with the side wall **46**. The retaining arm **58** can be of any desired shape and includes a retaining boss **60** located at or near the inner end of the retaining arm **58**. In the illustrated embodiment, the retaining boss **60** is substantially rectangular in shape. The retaining boss **60** is configured to engage the retaining hole **38** in the blade **30**, as described below. The portion of the retaining arm **58** with the retaining boss **60** can be biased inwardly, i.e., toward the interior of the guard **44**, in any conventional manner.

[0039] The guard **44** can further include a second or locking arm **62** which can be formed integrally with the guard side wall **46**. The locking arm **62** can be a movable, e.g., cantilevered, arm with one end biased inwardly and having a locking boss **64** configured to engage the locking hole **40** on the blade **30** and/or the locking device (e.g., rib **29**) on the handle **10** as described below. The outer end of the locking arm **62** can include a raised contact portion or button **66** which can be pushed to pivot the locking arm **62** around a pivot point **68** to move the locking boss **64** outwardly, e.g., out of the locking hole **40**, to unlock the blade, as described below.

[0040] The guard **44** can further include a blade deflection device **70** (Figs. 5 and 6). In the illustrated exemplary embodiment, the blade deflection device **70** is formed by a section of the top wall **48** which, upon the application of pressure by a user, can be bent inwardly (in the direction of arrow A in FIG. 6) as described below. The outer surface of the blade deflection device **70** can include a contact portion **72** having ribs for easier gripping and movement of the deflection device **70**.

[0041] Figs. 7 and 8 show a blade **30** positioned within the guard **44**. As can be seen particularly in FIG. 8, the blade **30** can be guided in the guard **44** by upper and lower channels **74**, **76**. The channels **74**, **76** can be defined by opposed sets of upper ribs **78a**, **78b** and lower

ribs **80a**, **80b**. The blade can be positioned in the guard **44** such that the retaining boss **60** of the retaining arm **58** releasably engages the retaining hole **38** on the blade **30** and presses the blade **30** against one side of the guide ribs **78a**, **80a** to retain the blade **30** in the guard **44**. The non-arcuate shape of the retaining hole **38** and retaining boss **60** helps prevent accidental slipping or rotation of the blade **30** around the retaining boss **60**. Additionally, the locking boss **64** engages the locking hole **40** on the blade **30**. This provides an additional safety feature preventing accidental withdrawal of the blade **30** from the guard **44**. In the practice of the invention, the individual blade **30** and guard **44** components can be supplied separately or the guard **44** and blade **30** can be supplied as a pre-assembled unit (blade and guard assembly **82**) and can be packaged in a sterile container, such as a foil container, and stored until desired.

[0042] In another non-limiting embodiment, the blade **30** need not have a separate retaining hole **38** but, rather, the retaining boss **60** can be configured to engage the attachment slot **36** of the blade **30**.

[0043] The guard **44** can further include a blade retention device **84** (Figs. 7 and 8) configured to prevent accidental disengagement of the blade **30** from the handle **10** when the guard **44** is in a retracted position, as described below. In the illustrated embodiment, the blade retention device **84** is configured as a projection or thicker portion of the guard **44** formed near the front of the guard **44**.

[0044] Operation and use of the exemplary surgical scalpel assembly of the invention described above will now be described.

[0045] In order to attach the blade and guard assembly **82** to the handle **10**, the attachment element **22** (projection) on the handle finger is guided into the attachment member **36** (slot) in the blade **30** and pushed forward in conventional manner. This is done by initially positioning the handle **10** at an angle with respect to the blade **30**. This attachment method is well known in the surgical field and will not be described in detail. As the handle **10** is pushed forwardly with respect to the guard **44**, the attachment element **22** (projection) slides into the slot **36** until the unlocking element **24** aligns with the retaining hole **38** on the blade **30** and pushes the retaining boss **60** out of the retaining hole **38** to snap the blade **30** onto the finger. In this position, the attachment element **22** of the handle **10** is engaged with the attachment member **36** of the blade **30** and the unlocking element **24** is engaged in the retaining hole **38**. Additionally, the locking boss **64** engages the locking hole **40**.

[0046] The guide elements (rails **52**, **54**) on the guard **44** slide into the guide channels **74**, **76** on the handle **10** such that the guard **44** can slide from a first position in which the guard **44** covers the cutting edge of the blade **30** to a second position in which the guard **44** is retracted into the internal cavity **18** of the handle **10** to uncover at least a portion of the cutting edge of the blade **30**, as

shown in Figs. 9 and 10. However, as will be appreciated by one skilled in the art, once the blade **30** is attached to the handle **10**, the guard **44** cannot initially be retracted into the handle **10** because the locking boss **64** is engaged in the locking hole **40** of the blade **30**. This prevents accidental movement of the guard **44** into the handle **10** and accidental exposure of the blade **30** until the locking boss **64** is released. In order to slide the guard **44** into the handle **10** and expose the blade **30**, the operator can press on the button **66** of the locking arm **62** to pivot the locking boss **64** out of the locking hole **40** in the blade **30**. This allows the guard **44** to be slid into the interior of the handle **10**, exposing the blade **30**. The scalpel assembly can then be used as intended. As will be appreciated from FIGS. 1 and 9, as the guard **44** is retracted into the handle **10**, the locking boss **64** slides along the outer surface of the locking rib **29**. When the guard **44** reaches a predetermined position, the locking boss **64** drops behind or engages the end surface **31** on the locking rib **29** due to the inward bias of the locking arm **62**. This locks the guard **44** in the retracted position and prevents the guard **44** from accidentally sliding forward on the handle **10** when the scalpel is being used. In order to unlock the guard **44** from the retracted position, the button **66** on the locking arm **62** can be pushed to rotate the locking boss **64** out of engagement with the end surface **31** to allow the guard **44** to be slid forwardly on the handle **10** to again cover the blade **30**. The guard **44** can be slid forwardly until the locking boss **64** re-engages the locking hole **40** to lock the guard **44** in its extended position. Between uses, the guard **44** can be slid forward, i.e., out of the handle **10**, to cover the cutting edge of the blade **30**.

[0047] In order to prevent accidental disengagement of the blade **30** from the handle **10** when the guard **44** is retracted into the handle **10**, the blade retention device **84** on the front of the guard **44** abuts or contacts the rear **34** of the blade **30** when the guard **44** is in the retracted position. This prevents deflection of the rear **34** of the blade **30** and, hence, prevents accidental disengagement of the finger from the blade slot **36** when the guard **44** is retracted into the handle **10**.

[0048] When use of the scalpel assembly is no longer required, the blade and guard assembly **82** can be disconnected as a unit from the handle **10** and discarded. To disengage the blade and guard assembly **82** from the handle **10**, the guard **44** can be slid outwardly until the locking boss **64** engages the locking hole **40** of the blade **30**. Then, the handle **10** can be tilted at an angle with respect to the blade **30** and the attachment element **22** disengaged from the blade slot **36** by pulling the handle **10** rearwardly, as is known in the art. When the handle **10** is angled outwardly, the unlocking element **24** is pulled out of the retaining hole **38**. The bias on the retaining arm **58** causes the retaining boss **60** to re-engage with the retaining hole **38** to hold the blade **30** in the guard **44**.

[0049] Alternatively, to help disengage the handle **10**

from the slot **36**, the blade deflection device **70** can be used. In order to facilitate disengagement, the deflection device **70** can be pressed inwardly (in the direction of arrow A) to push against and deflect the rear **34** of the blade **30** toward the guard side wall **46** and, thus, bend or angle the rear **34** of the blade **30** toward the side wall **46**. By bending the rear **34** portion of the blade **30**, this angles the rear **34** of the blade **30** with respect to the longitudinal axis of the guard **44** and facilitates removal of the handle **10** with the blade slot **36**. The handle **10** can then be cleaned, such as by autoclaving, and can be reused. As will be appreciated, the deflection device **70** could also be used to aid in attaching the handle **10** to the blade **30** by bending the rear **34** of the blade **30** to provide for easier insertion of the attachment element **22** of the handle **10** into the slot **36** of the blade **30**.

[0050] An alternative blade and guard assembly **88** of the invention is shown in FIG. 11. In this embodiment, the guard **89** includes opposed positioning ribs **90**, **92** to align the forward portion of the blade **30**. However, the guard **89** also includes a blade holding device, such as a hook or projection **94**, that biases or bends the rear of the blade **30** when the blade **30** is in the guard **89**. As described above, it is easier to attach a handle **10** to the blade **30** when the rear **34** of the blade **30** is deflected and, thus, presents easier access of the handle attachment element **22** with the slot **36** on the blade **30**. As will be appreciated from the blade and guard assembly **88** of FIG. 11, as the handle **10** is pushed forwardly into the slot **36**, the handle **10** pushes the blade **30** forward and disengages the rear **34** of the blade **30** from the projection **94** to snap the rear **34** of the blade **30** onto the finger of the handle **10**.

[0051] A still further blade and guard assembly **96** is shown in FIG. 12. In this embodiment, the blade **98** includes a rear engagement slot **100** defined between two rear arms **102**, **104**. Each arm **102**, **104** includes an engagement member, such as a slot **106**, **108**, and an attachment member, such as a tooth or projection **110**, **112**. The guard **114** includes engagement elements, such as hooks **116**, **118**, to bias the arms **102**, **104** outwardly when the blade **98** is positioned in the guard **114**. The handle **120** includes a finger **122** having attachment elements, such as slots or depressions **124**, **126**. As the handle **120** is pushed into the guard **114**, the finger **122** enters the slot **100** and pushes the blade **98** forward to disengage the hooks **116**, **118** from the slots **106**, **108** to cause the arms **102**, **104** to snap toward each other and engage the projections **110**, **112** on the blade **98** with the depressions **124**, **126** on the handle **120** to lock the blade **98** onto the handle **120**.

[0052] It will be readily appreciated by those skilled in the art that modifications may be made to the invention without departing from the concepts disclosed in the foregoing description. Accordingly, the particular embodiments described in detail herein are illustrative only and are not limiting to the scope of the invention, which is to be given the full breadth of the appended claims

and any and all equivalents thereof.

Claims

1. A surgical scalpel assembly, comprising:

- (a) a handle comprising a blade carrier having a blade attachment element;
- (b) a guard, comprising:

- a retaining arm having a non-arcuate retaining boss; and

- (c) a blade, comprising:

- a slot configured to engage the attachment element of the blade carrier; and
- a retaining hole having a non-arcuate shape and configured to engage the retaining boss of the guard.

2. The scalpel assembly of claim 1, wherein the guard further comprises a locking arm having a locking boss and the blade includes a locking hole configured to engage the locking boss.

3. The scalpel assembly of claim 1, wherein the handle comprises opposed guide channels and the guard includes rails configured to engage the guard channels such that the guard is slidable into and out of the handle.

4. The scalpel assembly of claim 1, wherein the guard includes a locking arm having a locking boss and the handle includes a locking device configured to engage the locking boss to lock the guard in a retracted position.

5. A surgical scalpel assembly, comprising:

- (a) a handle, comprising:

- a handle body having an attachment element projecting therefrom;
- a side wall, a top wall, and a bottom wall defining a handle cavity; and
- guide grooves defined in the top wall and bottom wall;

- (b) a guard, comprising:

- a guard body having a top wall, a bottom wall, and a side wall;
- a guide rail projecting from the top and bottom walls of the guard and configured to engage the guide grooves in the handle body such that the guard is slidable into

- and out of the handle body;
 a retaining arm biased inwardly from the guard side wall;
 a retaining boss attached to the retaining arm, the retaining boss having a non-arcuate cross section; 5
 a locking arm biased inwardly from the guide side wall, the locking arm comprising a movable arm with a locking boss attached at one end; and 10
 a blade deflection device movably mounted on the guard; and
- (c) a blade, comprising: 15
 an elongated attachment slot configured to engage the attachment element of the handle;
 a retaining hole configured to engage the retaining boss of the retaining arm; and 20
 a locking hole configured to engage the locking boss of the locking arm.
6. A surgical scalpel assembly, comprising: 25
 (a) a handle comprising a blade attachment element;
 (b) a blade comprising an attachment member configured to engage the attachment element of the handle; and 30
 (c) a guard configured to engage the handle, the guard comprising a blade deflection device.
7. A surgical scalpel assembly, comprising: 35
 (a) a handle comprising a blade attachment element and a locking device;
 (b) a blade, comprising: 40
 an attachment member configured to engage the attachment element of the handle; and
 a locking element; and
 (c) a guard, comprising: 45
 a locking arm configured to engage the locking element of the blade when the guard is in a first position and configured to engage the locking device of the handle when the guard is in a second position. 50
8. A surgical scalpel assembly, comprising: 55
 (a) a handle; and
 (b) a blade and guard assembly, comprising:
 a guard, including:
- a first biased arm having a first boss; and
 and
 a second movable arm having a second boss; and a blade, including:
 an attachment member configured to engage the handle;
 a first hole configured to receive the first boss when the blade is connected to the guard and the handle is not attached to the blade; and
 a second hole configured to receive the second boss when the blade is in the guard.
9. A surgical scalpel assembly, comprising:
 (a) a blade having a pair of rear arms each having an engagement member and an attachment member;
 (b) a guard having a pair of engagement elements configured to engage the engagement members of the blade arms to bias the arms outwardly; and
 (c) a handle having a pair of attachment elements configured to engage the attachment members of the blade when the handle is inserted between the blade arms.
10. A blade and guard assembly, comprising:
 (a) a guard, including:
 a first biased arm having a first boss; and
 a second movable arm having a second boss; and
 (b) a blade, including:
 an attachment member configured to engage the handle;
 a first hole configured to receive the first boss when the blade is connected to the guard and the handle is not attached to the blade; and
 a second hole configured to receive the second boss when the blade is in the guard.
11. The blade and guard assembly of claim 10, wherein the guard includes a blade deflection device configured to bend a rear portion of the blade when the blade is positioned in the guard.

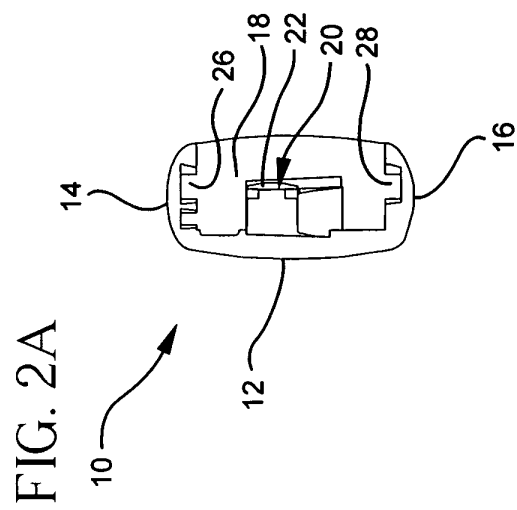
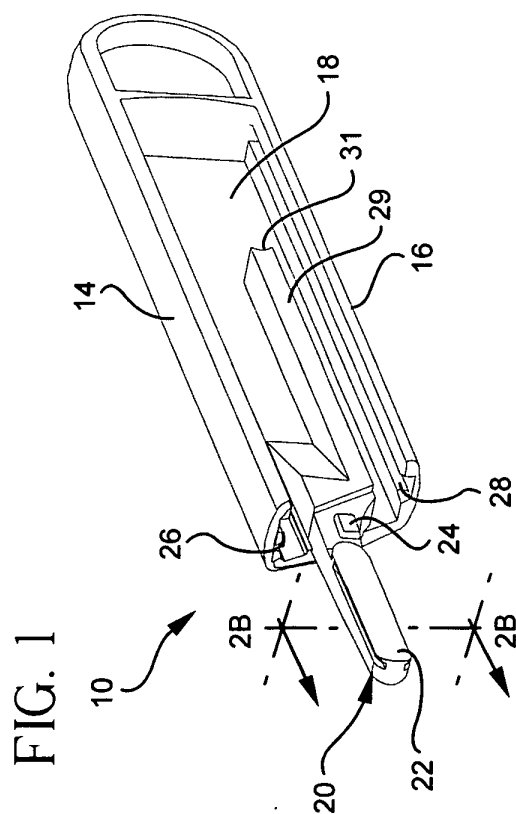


FIG. 2B

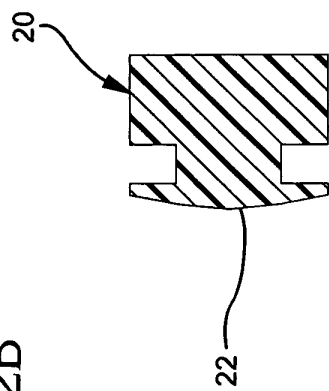


FIG. 3

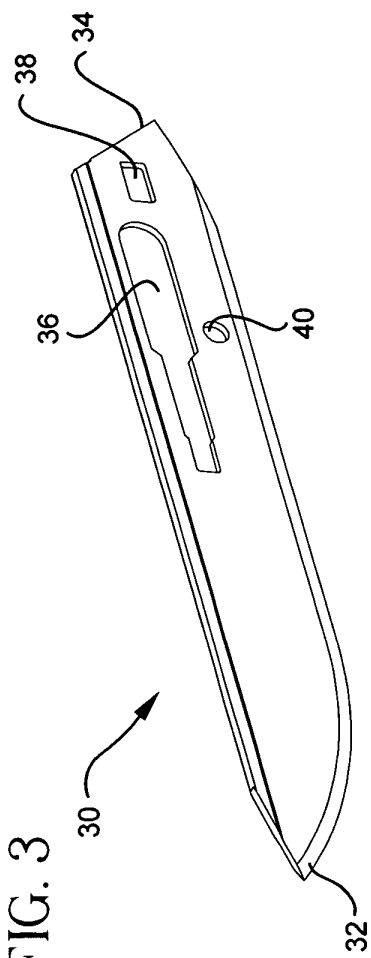


FIG. 4

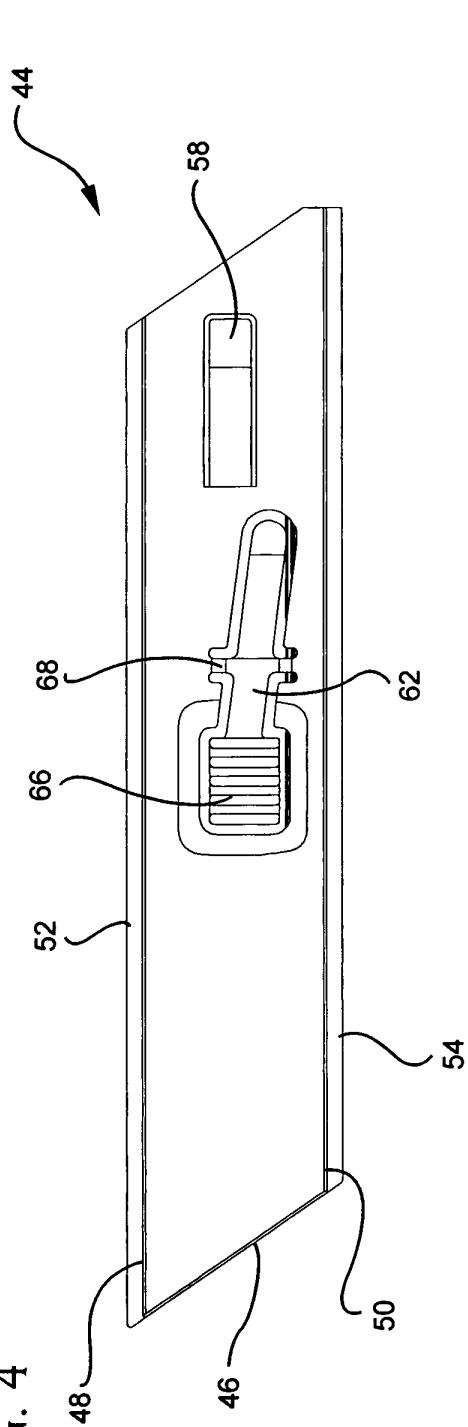


FIG. 5

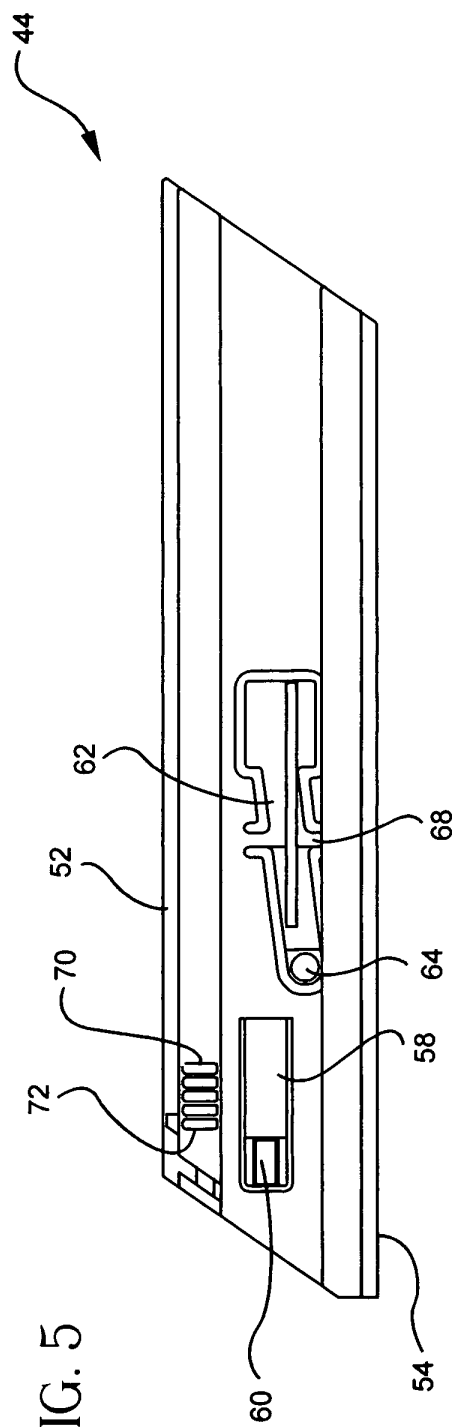
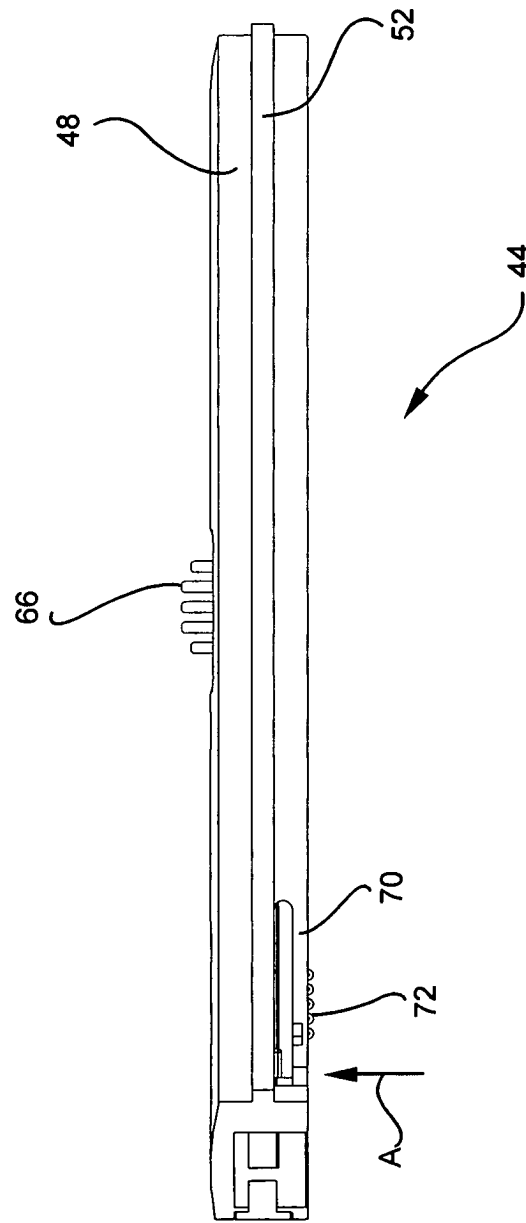


FIG. 6



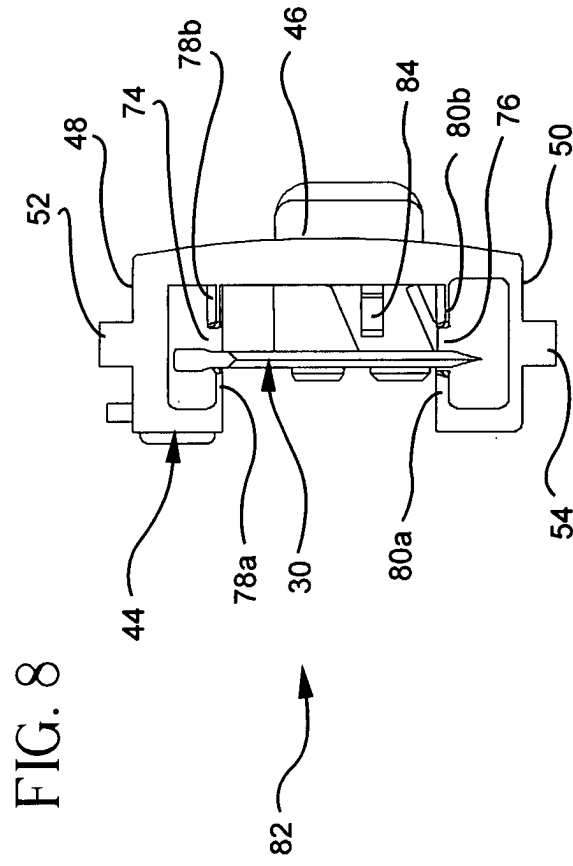
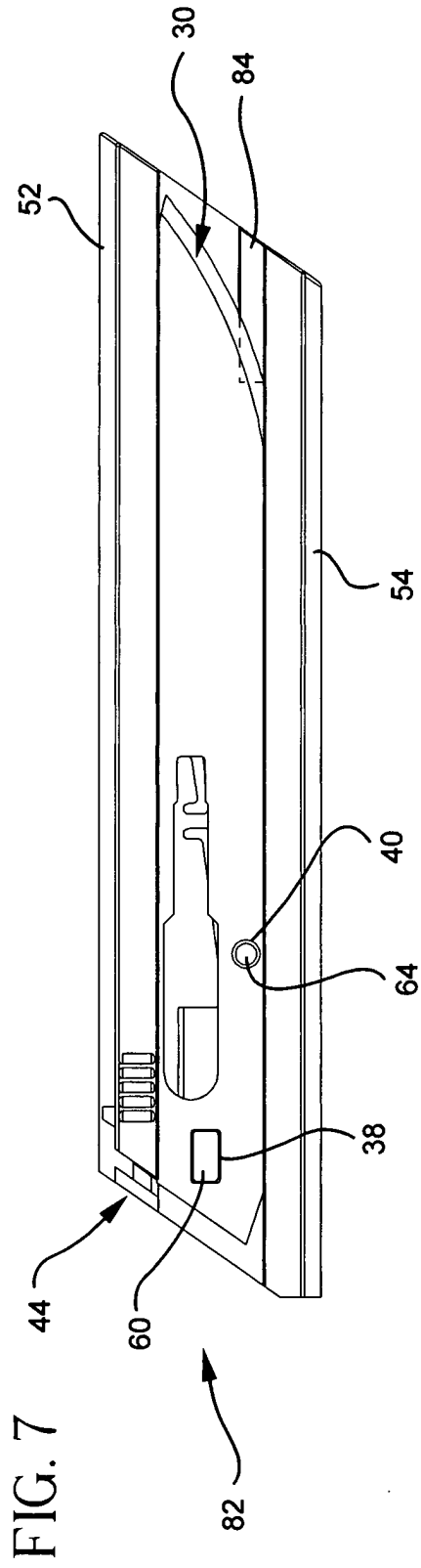
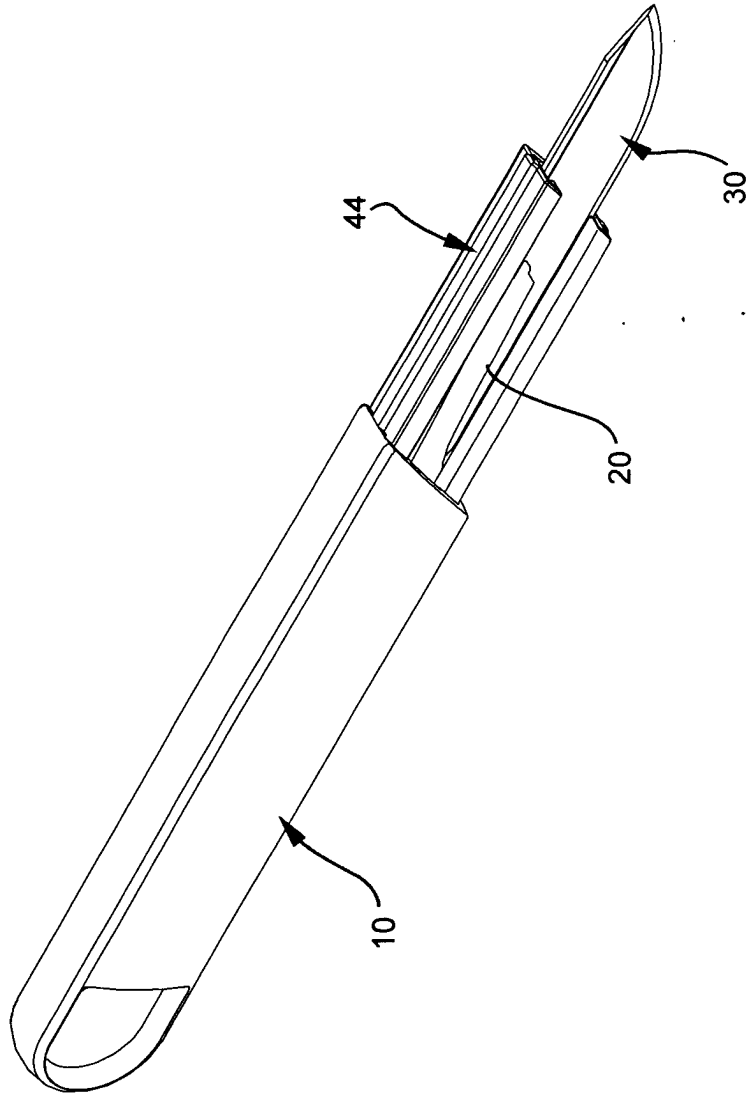


FIG. 9



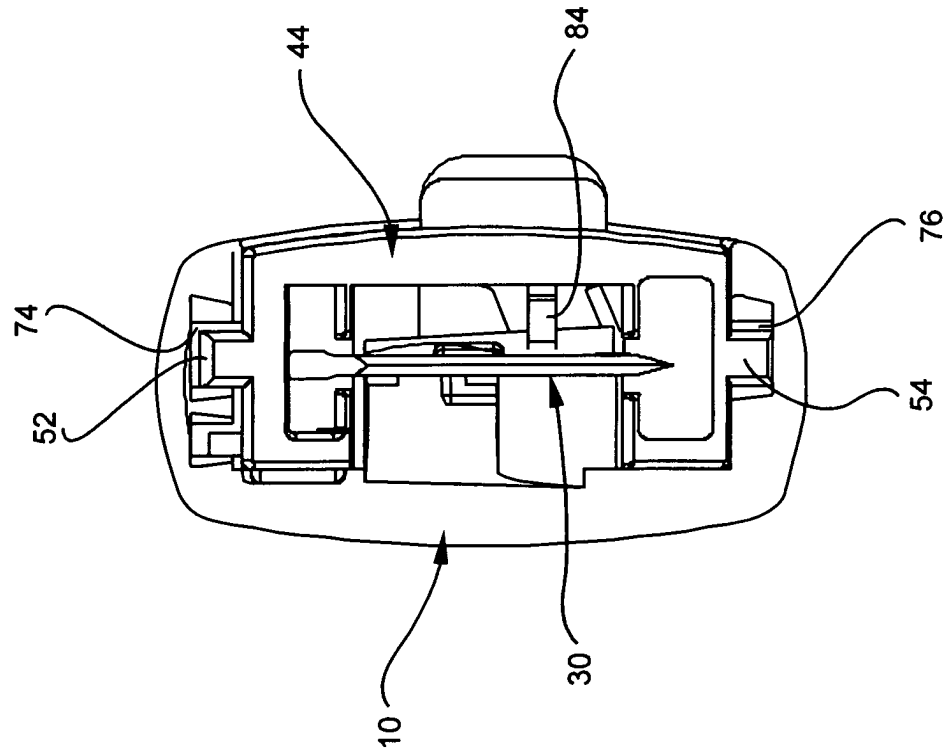


FIG. 10

FIG. 11

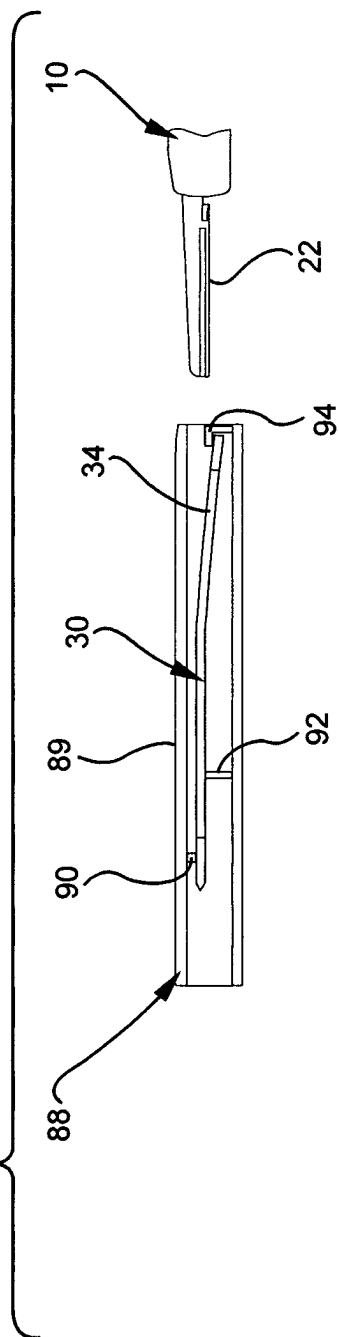


FIG. 12

